SUPPORTING INFORMATION

Synthesis and characterization of a Schiff base crosslinked hydrogel based on hyperbranched polyglycerol

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Schiff base hydrogels have attracted much attention in recent years in the field of biomedical applications, due to the reversibility of the imine bond, granting the gels degradation properties. Commonly used multifunctional amines include proteins and polysaccharides like bovine serum albumin and chitosan, that exhibit low water solubility and require acidic pH to solve. One of the most commonly used dialdehydes, utilized for Schiff base formation, is glutaric aldehyde, that is known to be toxic. We are presenting a new two component Schiff-base-crosslinked hydrogel based on a aminoterminated hyperbranched polyglycerol (hPG-NH_2) and a polyethyleneglycol dialdehyde (PEG-DA), that shows promising mechanical properties. The hPG-NH_2 is synthesized by a photoinitiated thiolene coupling reaction, following a previously established copolymerization of glycidol and allyl glycidyl ether. The polyethyleneglycol-dialdehyde was synthesized in a one-pot synthesis, by the addition of isophorone diisocyanate (IPDI) and hydroxymethylfurfural (HMF). The hydrogels were characterized regarding their mechanical properties with a texture analyzer. With this method, the impact of the solid content, the ratio of the components and the pH on the gel properties was studied

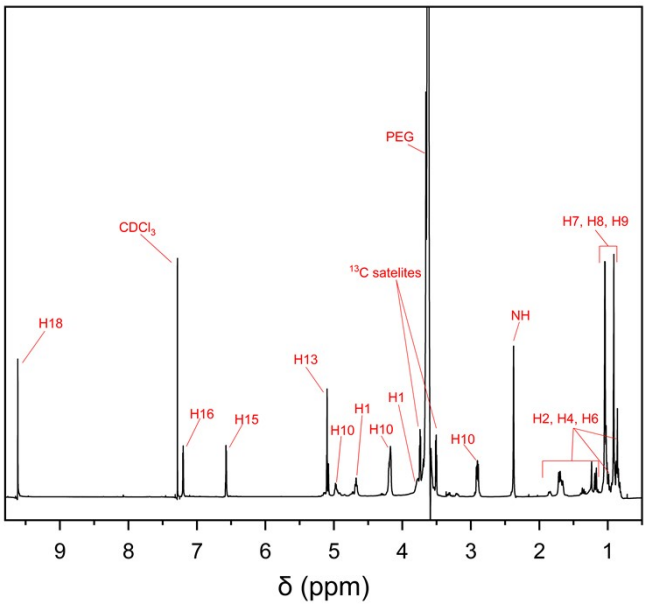

Figure S 1: ^{1}H-NMR of PEG-DA

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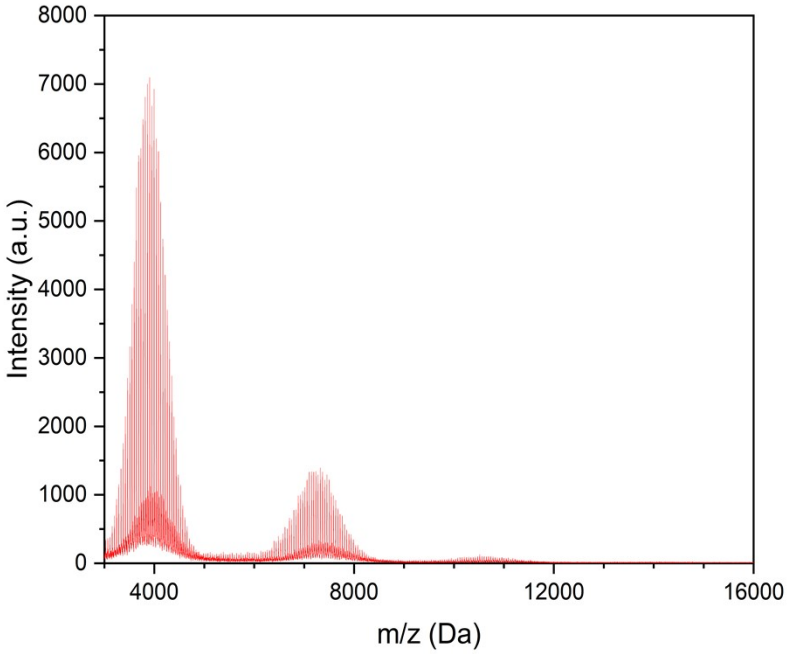

Figure S 3: MALDI-ToF spectrum of PEG-DA (3-16 kDa); Showing the mono-, di- and trimer of the HMF-IPDI-(PEG-IPDI)n-HMF oligomers

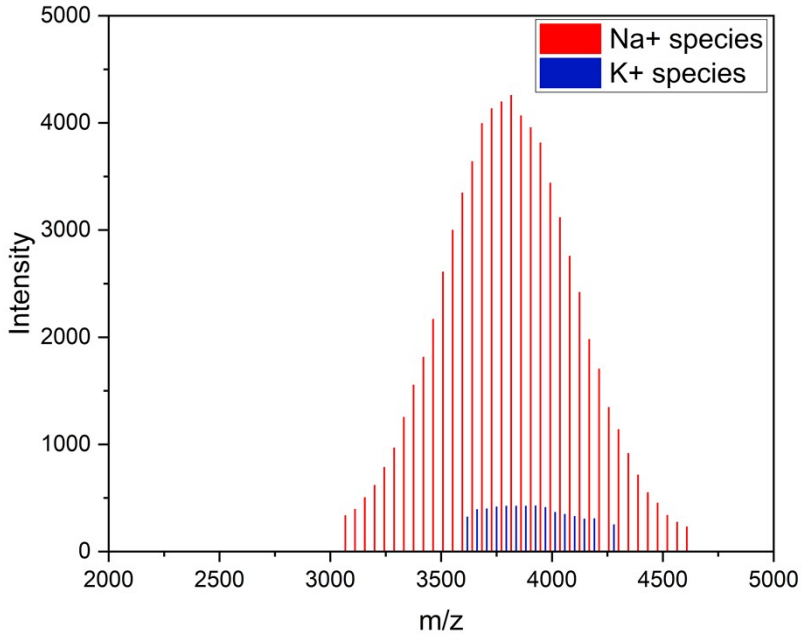

Figure S 2: MALDi-ToF spectrum of PEG-DA (2-5 kDa)

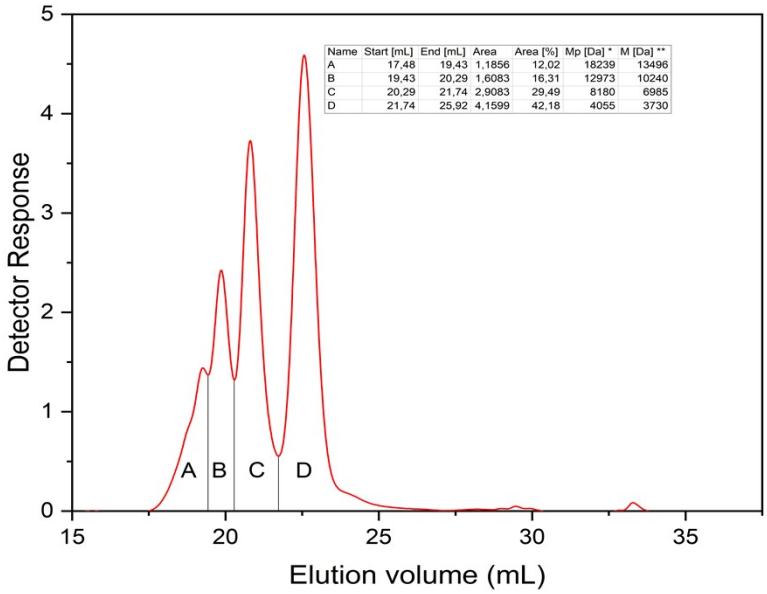

Figure S 4: GPC of PEG-DA; * measured by GPC; ** theoretical molar mass of the oligomer (HMF-IPDI-(PEG-IPDI)$_n$-HMF)

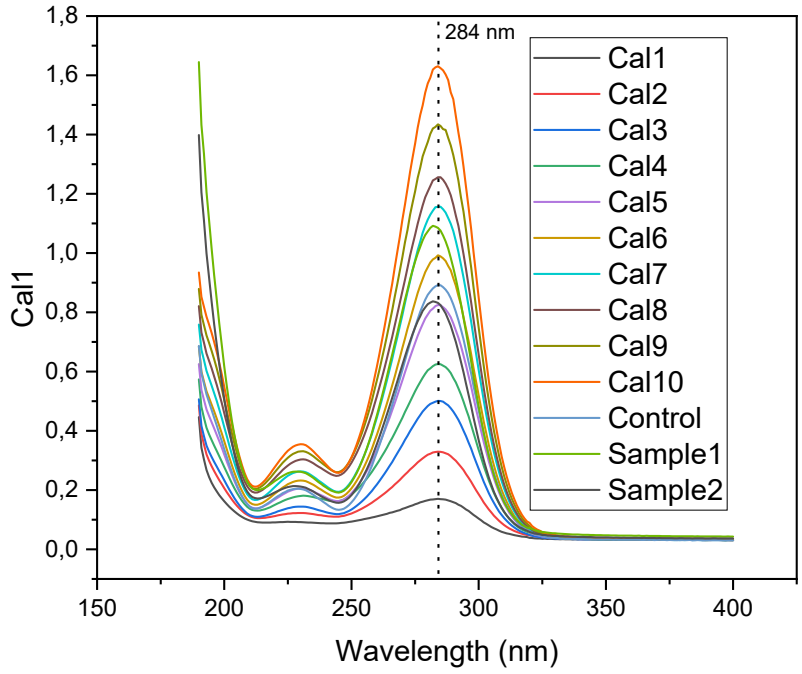

Figure S 5: UV-Vis spectrum of PEG-DA calibrated with HMF solutions

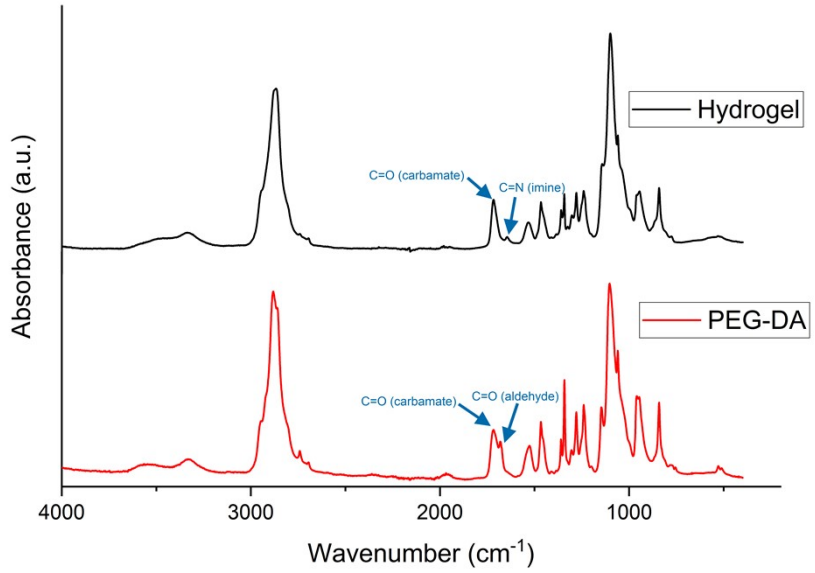

Figure S 6: IR-spectra of PEG-DA and the dried hydrogel